

Trend Study 16B-24-99

Study site name: Wiregrass Bench .

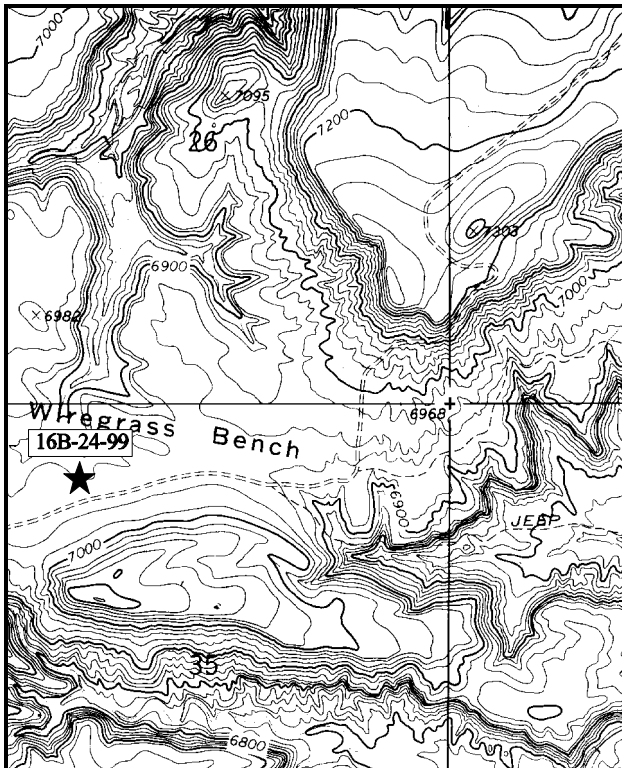
Range type: Big Sagebrush - Grass .

Compass bearing: frequency baseline 0°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

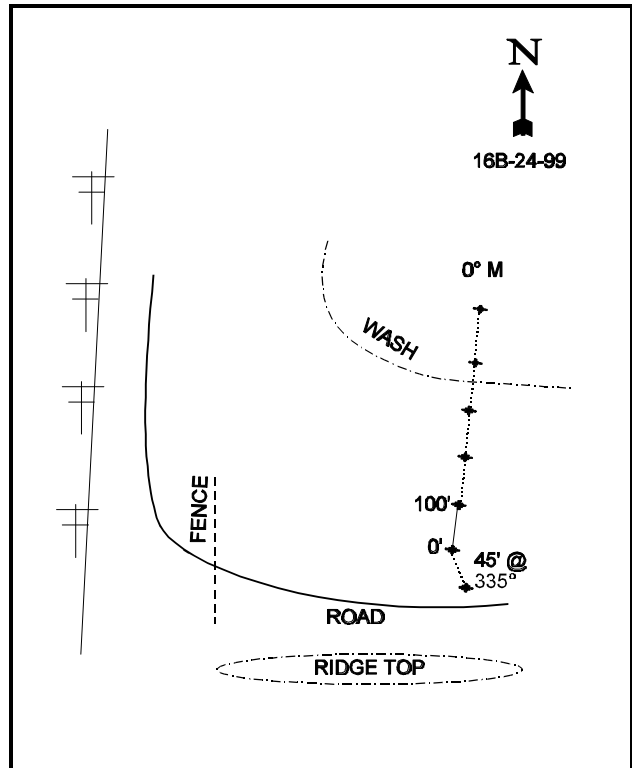
LOCATION DESCRIPTION

Take exit 240 on highway 6 in Price just past the hospital. Turn right at the stop sign, continue to another stop sign and turn right again. Stay on this road until you go over a canal, then turn right at the first road on the right. Proceed 6.8 miles to a railroad crossing. From the railroad tracks, travel 4.1 miles. Just before reaching the power lines turn left and travel 0.5 miles along the fence to a "T" in the road. Turn left through a gate and travel 0.3 miles to the witness post on the left. The 0' stake is 9 paces at 330/ M. The baseline runs in the direction of 0°M.



Map Name: Pinnacle Peak

Township 14S , Range 8E , Section 35



Diagrammatic Sketch

UTM 4379739.980 N, 500290.613 E

DISCUSSION

Trend Study No. 16B-24 (30-10)

The Wire Grass Bench was a new study established in 1994 on Wiregrass Bench. It was placed to monitor possible sagebrush die-off on important winter range. The site occurs within the Haley allotment which is grazed from May 16 to October 31 by 27 cattle. Pellet group frequency data from 1994 indicated a high proportion of rabbit and deer use on the site as well as some elk use. Pellet group transect data taken in 1999 estimate moderate use by wildlife with 38 deer days use/acre (93 ddu/ha) and 23 elk days use/acre (56 edu/ha). Livestock use is currently estimated at 15 cow days use/acre (38 cdu/ha).

The site has a west aspect and a gentle slope of 5%. Elevation is 6,900 feet. Soil depth is quite deep with an estimated effective rooting depth of over 20 inches. The soil is slightly alkaline pH (7.6). Rock is fairly uniformly distributed throughout the profile as evidenced by the stoniness index data. Phosphorus levels in the soil (6.8 ppm) are somewhat lower than 10 ppm thought necessary for normal plant growth and development. Percent bare ground is fairly low for a Wyoming big sagebrush site at 32% in both 1994 and 1999.

The key browse species on this site is Wyoming big sagebrush which had a population density of only 1,860 plants/acre in 1994. The population increased between 1994 and 1999, and is currently estimated at 2,380 plants/acre. Age class analysis indicates a continued expansion of Wyoming big sage with increases in biotic potential (1% to 11%) and recruitment (10% to 18%) in 1999. Percent cover for this species nearly doubled in 1999, from 5.5% to 9.7%. Half of the shrubs were decadent (50%) in 1994, with most of the remainder being mature (41%). Percent decadency decreased to 29% in 1999, while the proportion of mature plants increased to 54%. Utilization increased considerably in 1999, with half of the population showing moderate use, and 10% showing heavy use. However, those plants classified as having poor vigor decreased from 14% in 1994 to 4% in 1999. Also, the proportion of decadent plants classified as dying decreased from 26% in 1994, to 12% in 1999. These parameters all indicate an improving trend for Wyoming big sagebrush. The number of dead shrubs to live ones is currently about 1 in 4, another improvement. Some of the mature and decadent plants sampled in 1999 show evidence of insect infestation.

The most numerous shrub on the site is the increaser low rabbitbrush, however it only provided 23% of the browse cover in 1999. This species had a 41% increase in density in 1999, currently estimated at 7,480 plants/acre. Much of this increase is a result of the young age class which increased by over 30-fold between 1994 and 1999. The majority of population is mature plants in both 1994 and 1999. Height and crown for rabbitbrush has greatly decreased in 1999, currently mature plants measure 4 inches by 8 inches. Broom snakeweed is present at the site and shows a stable population of mostly mature plants estimated at 3,260 plants/acre and 3,480 plants/acre in 1994 and 1999 respectively.

The herbaceous understory is very abundant and diverse. Grasses provide 66% and 50% of the total vegetation cover in 1994 and 1999 respectively. Unfortunately, blue grama and Salina wildrye account for the majority of the cover. Blue grama is a warm season grass which provides little forage and increases under excessive spring livestock grazing. This species did significantly decrease in sum of nested frequency in 1999, and its cover value was less than half that in 1994. Salina wildrye provides poor to fair forage for livestock and big game. This species significantly increased in nested frequency in 1999, and currently provides 27% of the total vegetation cover. Other perennial species include: mutton bluegrass, Indian ricegrass, and bottlebrush squirreltail. Forbs are diverse but not abundant. However, perennial forbs nearly doubled in sum of nested frequency in 1999. A few important perennial species like paint brush, redroot eriogonum and globemallow occur on the site.

1994 APPARENT TREND ASSESSMENT

Ground cover characteristics show adequate cover to control soil erosion. Herbaceous ground cover is high at 25% and litter cover is also high for a Wyoming big sagebrush site at 23%. The apparent browse trend is declining somewhat for Wyoming big sagebrush. Biotic and reproductive potentials are low and the majority of the population is decadent. This is likely caused by a combination of drought and competition from the abundant herbaceous understory and increaser shrubs rabbitbrush and broom snakeweed. The herbaceous understory is abundant and diverse but the composition of grasses is dominated by blue grama and Salina wildrye, both of which offer only fair forage value.

1999 TREND ASSESSMENT

Trend for soil is stable. Percent cover of vegetation, litter and bare ground all stayed nearly the same over the last 5 years. Erosion is not a problem at the site, and herbaceous sum of nested frequency increased in 1999. Trend for the key browse Wyoming big sagebrush is up. Percent decadency decreased from 49% to 29%, the proportion of decadent plants classified as dying decreased from 26% to 12%, and plants showing poor vigor decreased from 14% to 4%. Biotic potential and recruitment both increased in 1999 as well. Improved precipitation patterns in last few years has helped restore vigor and increase the number of seedlings and young. The only negative aspect for this population of Wyoming big sagebrush is that use has increased. Currently, 50% of the population is classified as moderately browsed, up from 16% in 1994. An additional 10% show heavy use. Trend for the herbaceous understory is slightly up. Perennial species dominate the understory. Sum of nested frequency for perennial grasses and forbs increased in 1999.

TREND ASSESSMENT

soil - stable

browse - up for the key species Wyoming big sagebrush

herbaceous understory - slightly up

HERBACEOUS TRENDS --

Herd unit 16B, Study no: 24

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'94	'99	'94	'99	'94	'99
G	Agropyron spicatum	10	2	3	2	.53	.01
G	Bouteloua gracilis	274	*230	77	72	10.33	4.77
G	Bromus tectorum (a)	5	20	2	6	.01	.20
G	Elymus salina	263	*294	73	84	9.56	8.72
G	Oryzopsis hymenoides	25	19	12	10	.38	.20
G	Poa fendleriana	91	98	23	35	.51	1.27
G	Sitanion hystrix	95	*53	39	20	1.06	1.19
G	Stipa comata	17	*4	6	1	.32	.00
Total for Annual Grasses		5	20	2	6	0.00	0.20
Total for Perennial Grasses		780	700	233	224	22.71	16.18
Total for Grasses		785	720	235	230	22.72	16.38
F	Agoseris glauca	-	*55	-	24	-	.24
F	Alyssum alyssoides (a)	-	*15	-	4	-	.02

Type	Species	Nested Frequency		Quadrat Frequency		Average Cover %	
		'94	'99	'94	'99	'94	'99
F	<i>Astragalus convallarius</i>	42	38	21	23	.41	.14
F	<i>Astragalus</i> spp.	7	13	2	5	.30	.21
F	<i>Castilleja chromosa</i>	14	*51	6	24	.05	.38
F	<i>Calochortus nuttallii</i>	3	*31	1	14	.00	.07
F	<i>Comandra pallida</i>	35	*69	16	29	.36	.19
F	<i>Collinsia parviflora</i> (a)	21	*27	10	13	.05	.06
F	<i>Crepis acuminata</i>	-	3	-	1	-	.03
F	<i>Cryptantha</i> spp.	2	-	2	-	.01	-
F	<i>Cymopterus</i> spp.	-	*7	-	3	-	.04
F	<i>Delphinium occidentale</i>	-	5	-	1	-	.00
F	<i>Descurainia pinnata</i> (a)	1	-	1	-	.00	-
F	<i>Eriogonum alatum</i>	4	*33	2	17	.03	.16
F	<i>Eriogonum racemosum</i>	44	45	20	23	.39	.32
F	<i>Eriogonum umbellatum</i>	3	1	2	1	.03	.00
F	<i>Hymenoxys acaulis</i>	1	-	1	-	.00	-
F	<i>Lappula occidentalis</i> (a)	-	3	-	1	-	.00
F	<i>Lepidium</i> spp. (a)	18	*-	8	-	.04	-
F	<i>Lesquerella</i> spp.	1	-	1	-	.00	-
F	<i>Machaeranthera grindelioides</i>	8	11	3	5	.06	.10
F	<i>Penstemon caespitosus</i>	5	*20	4	9	.05	.09
F	<i>Penstemon palmeri</i>	3	-	2	-	.01	-
F	<i>Phlox longifolia</i>	43	*74	17	32	.08	.56
F	<i>Plantago patagonica</i> (a)	42	37	14	12	.12	.08
F	<i>Polygonum douglasii</i> (a)	21	*6	9	3	.04	.01
F	<i>Schoenocrambe linifolia</i>	14	12	6	5	.03	.02
F	<i>Sphaeralcea coccinea</i>	52	48	21	23	.18	.48
F	<i>Taraxacum officinale</i>	7	12	2	4	.01	.02
F	<i>Zigadenus paniculatus</i>	-	*24	-	13	-	.06
Total for Annual Forbs		103	88	42	33	0.26	0.18
Total for Perennial Forbs		288	552	129	256	2.05	3.16
Total for Forbs		391	640	171	289	2.31	3.35

* Indicates significant difference at % = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 16B, Study no: 24

Type	Species	Strip Frequency		Average Cover %	
		'94	'99	'94	'99
B	Amelanchier utahensis	2	2	-	-
B	Artemisia tridentata wyomingensis	58	66	5.51	9.74
B	Chrysothamnus viscidiflorus	72	76	2.94	2.96
B	Echinocereus spp.	0	4	-	-
B	Gutierrezia sarothrae	63	34	.61	.18
B	Opuntia spp.	9	3	.01	-
B	Pinus edulis	0	1	.38	.15
Total for Browse		204	186	9.46	13.05

BASIC COVER --

Herd unit 16B, Study no: 24

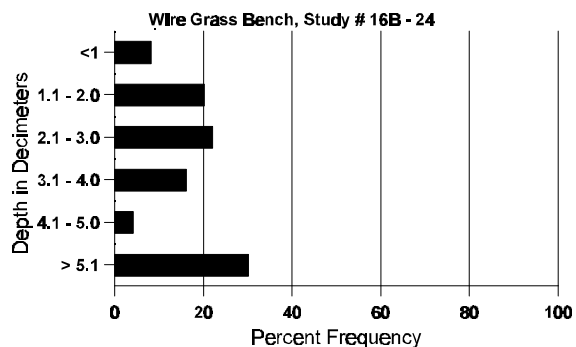
Cover Type	Nested Frequency		Average Cover %	
	'94	'99	'94	'99
Vegetation	438	433	34.32	32.04
Rock	131	30	1.33	.57
Pavement	118	60	.41	.33
Litter	479	475	23.33	24.23
Cryptogams	231	278	3.75	13.03
Bare Ground	433	384	31.76	32.17

SOIL ANALYSIS DATA --

Herd Unit 16B, Study # 24, Study Name: Wire Grass Bench

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
20.2	51.6 (16.8)	7.6	34.7	41.4	23.8	1.7	6.8	121.6	0.6

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 16B, Study no: 24

Type	Quadrat Frequency		Pellet Transect Days Use/Acre (ha)
	'94	'99	'09
Rabbit	33	56	n/a
Elk	12	5	23 (57)
Deer	36	53	38 (94)
Cattle	6	7	15 (37)

BROWSE CHARACTERISTICS --

Herd unit 16B, Study no: 24

A Y G R E		Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht. Cr.		
Amelanchier utahensis																		
Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	-	2	-	-	40			2
M	94	1	1	-	-	-	-	-	-	-	2	-	-	-	40	17	20	2
	99	-	-	-	-	1	-	-	-	-	1	-	-	-	20	37	42	1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'94		50%			00%			00%			+33%							
'99		33%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	40	Dec:	-			
												'99	60		-			
Artemisia tridentata wyomingensis																		
S	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	4	-	-	9	-	-	-	-	-	13	-	-	-	260			13
Y	94	7	-	-	2	-	-	-	-	-	9	-	-	-	180			9
	99	17	1	-	2	1	-	-	-	-	21	-	-	-	420			21
M	94	34	5	-	-	-	-	-	-	-	38	1	-	-	780	22	33	39
	99	19	39	5	-	1	-	-	-	-	63	-	1	-	1280	23	34	64
D	94	32	10	1	3	-	-	-	-	-	33	-	1	12	920			46
	99	8	16	5	-	1	2	2	-	-	30	-	-	4	680			34
X	94	-	-	-	-	-	-	-	-	-	-	-	-	-	580			29
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	760			38
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'94		16%			01%			14%			+21%							
'99		50%			10%			04%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	1880	Dec:	49%			
												'99	2380		29%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus																		
S	94	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	99	10	-	-	-	-	-	-	-	-	10	-	-	200			10	
Y	94	2	-	-	-	-	-	-	-	-	2	-	-	40			2	
	99	62	2	-	-	-	-	-	-	-	64	-	-	1280			64	
M	94	212	-	-	6	-	-	-	-	-	218	-	-	4360	21	25	218	
	99	297	12	1	-	-	-	-	-	-	310	-	-	6200	4	8	310	
X	94	-	-	-	-	-	-	-	-	-	-	-	-	20			1	
	99	-	-	-	-	-	-	-	-	-	-	-	-	20			1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'94		00%			00%			00%			+41%							
'99		04%			.26%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	4400	Dec:	-			
												'99	7480		-			
Echinocereus spp.																		
M	94	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	99	4	-	-	-	-	-	-	-	-	4	-	-	80	1	2	4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'94		00%			00%			00%										
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	0	Dec:	-			
												'99	80		-			
Gutierrezia sarothrae																		
Y	94	2	-	-	-	-	-	-	-	-	2	-	-	40			2	
	99	27	-	-	-	-	-	-	-	-	27	-	-	540			27	
M	94	159	-	-	-	-	-	-	-	-	159	-	-	3180	31	6	159	
	99	146	-	-	-	-	-	-	-	-	146	-	-	2920	3	4	146	
D	94	2	-	-	-	-	-	-	-	-	1	-	-	40			2	
	99	-	-	-	-	-	-	-	-	-	-	-	-	20			1	
X	94	-	-	-	-	-	-	-	-	-	-	-	-	40			2	
	99	-	-	-	-	-	-	-	-	-	-	-	-	100			5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'94		00%			00%			.61%			+ 6%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	3260	Dec:	1%			
												'99	3480		1%			
Opuntia spp.																		
M	94	10	-	-	3	-	-	-	-	-	13	-	-	260	3	7	13	
	99	4	-	-	-	-	-	-	-	-	4	-	-	80	2	5	4	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'94		00%			00%			00%			-69%							
'99		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'94	260	Dec:	-			
												'99	80		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total
		1	2	3	4	5	6	7	8	9	1	2	3	4			
Pinus edulis																	
Y	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>						
		'94			00%			00%			00%						
		'99			00%			00%			00%						
Total Plants/Acre (excluding Dead & Seedlings)												'94	0	Dec:	-		
												'99	20		-		